

REMARKS

In the Office Action mailed January 19, 2007, claims 1, 2, 4-6, 9-14, 17-19 and 21-23 were rejected, claims 11 and 14-16 were objected to, and claims 7, 8, 20 and 24-27 were withdrawn from consideration. Claims 11 and 14-16 were objected to because of informalities. Claims 15 and 16 were objected to as depending from a rejected base claim, but were indicated to be allowable if rewritten in independent form. Claims 1, 9 and 10 were rejected under 35 U.S.C. §102(e) as being anticipated by Zhu (U.S. Pat. No. 6,870,706). Claims 4-6, 11-14, 17-19 and 21-23 were rejected under 35 U.S.C. §103(a) as being obvious over Zhu. Claim 2 was rejected under 35 U.S.C. §103(a) as being obvious over Zhu in view of Hirano et al. (U.S. Pat. No. 6,853,517) and/or Hanchi et al. (U.S. Pat. No. 6,967,805).

Claim Objections

Claims 11 and 14-16 were objected to because of informalities. With the present amendment, claims 11, 14 and 15 have been amended as suggested in the Office Action to correct the informalities. The objections to those claims should therefore be withdrawn. Notification to that effect is requested.

Claims 15 and 16 were objected to as depending from a rejected base claim, but were indicated to be allowable if rewritten in independent form. As explained further below, it is believed that independent claim 11, from which claims 15 and 16 depend, is in condition for allowance. Therefore, the objections to dependent claim 15 and 16 should be withdrawn.

Claim Rejections - 35 U.S.C. §102(e)

Claims 1, 9 and 10 were rejected under 35 U.S.C. §102(e) as being anticipated by Zhu (U.S. Pat. No. 6,870,706).

Independent claim 1 relates to a transducing head that requires a substrate, a writer having a writer core, a reader, an electrically insulating material, and an electrical connector for grounding the writer to the substrate. According to independent claim 1, the reader and the writer core must be electrically isolated from one another by the electrically insulating material.

Zhu discloses a method for suppressing tribocharge in the assembly of magnetic heads. Zhu discloses connecting a read head 2 to a substrate 20 to provide electrostatic discharge (ESD) protection. (Zhu, col. 4, ll. 39-41; col. 5, ll. 43-65; FIGS. 1-6d). The concern of Zhu is with grounding an undershield 10 of a read head 2 to a substrate 3 or 20. (Zhu, col. 9, 37-39). Zhu discusses prior art head gimbal assemblies (HGAs), and indicates that the invention of Zhu regards adding a direct connection between a read head 2 under-shield 10 and a grounded substrate 20 (which is designed by reference number 3 when in wafer form) to a basic prior art HGA design. (Zhu, col. 1, ll. 20-41; col. 4, ll. 26-30 and 39-40; col. 5, ll. 43-65; col. 6, ll. 40-57; col. 8, ll. 3-9; FIGS. 1-6d). Zhu appears to disclose that a grounding path is formed through the overcoat 21 that electrically links the read head 2 (which includes the upper shield 8, the under-shield 10 and the GMR element 13), the write head 4 (which includes the inductive coil 6 and the writer core 18), and the slider substrate 20. (Zhu, col. 1, ll. 22-63; col. 4, ll. 26-30; col. 7, line 53 to col. 8, line 2; col. 8, ll. 3-8; FIGS. 1-6d). The GMR element 13 is electrically connected to the upper shield 8 and the under-shield 10 by a balanced half-bridge. (Zhu, col. 6, ll. 25-32; col. 9, ll. 43-65;; FIGS. 7a-7b). Zhu explains that while the grounding path through the overcoat 21 remains, an additional direct grounding path between the under-shield 10 of the read head 2 is made to the substrate 20 to form a lower resistance path than through the overcoat 21. (Zhu, col. 4, ll. 26-30 and 39-42; col. 7, ll. 38-46). Zhu discloses four embodiments for grounding the undershield 10 of the read head 2:

In one embodiment, the undershield is formed directly on the substrate. In a second embodiment, an insulating undercoat is first formed on the substrate and the under-shield is formed on the undercoat but contacts the substrate through a via formed in the undercoat. In yet a third embodiment, the undershield is again formed the undercoat, a via is formed in the undercoat and the via is filled with a resistive material. The undershield thereby contacts the substrate through the resistive material. Finally, in a fourth embodiment, the undershield is connected to the wafer substrate through a resistive strip.

(Zhu, col. 5, ll. 43-54).

Zhu discloses that the read head 2 (i.e., the GMR element 13 and the upper and under shields 8 and 10), the writer core 18 and the substrate 20 are electrically linked, that is, they form an "isolated unit". (Zhu, col. 7, line 53 to col. 8, line 2). Indeed, Zhu refers to the read head 2 and the write head 4 collectively as GMR head 1, which further emphasizes that the read and write heads 2 and 4 are electrically linked. (Zhu, col. 7, ll. 12-17 and 38-46; col. 8, ll. 1-2; FIGS. 4a, 4b and 5). A flex circuit cable 30 including conductive traces 32 on an insulator 34 are electrically connected to the GMR head 1, which includes the electrically linked read head 2 and write head 4. (Zhu, col. 7, ll. 17-41; FIGS. 1-4b). Electrical grounding of a writer core is not a concern of Zhu, although the writer core 18 and the grounded undershield 10 of the read head 2 are electrically connected.

It should further be noted that the disclosure of Zhu is similar to prior art that teaches "reader bleeders" that ground only reader elements during fabrication. As noted at pages 3 and 4 of the present application, reader bleeders like those of Zhu are distinguishable from the presently claimed invention because reader bleeders are, for various reasons, configured only for use during hard disc drive fabrication and not during hard disc drive use.

Zhu fails to show, teach or disclose each and every limitation of independent claim 1, because Zhu fails to show, teach or disclose a reader and a writer core that are electrically isolated from one another as required by that claim. As noted above, Zhu discloses that the read head 2 and the write head 4 are electrically linked together through the overcoat 21. While Zhu only shows that electrical connection in figures labeled "prior art," the disclosure of Zhu is clear that the overcoat 21 remains in the disclosed inventive embodiments even though it is not shown in the other figures. Indeed, Zhu notes that its inventive solution to reader grounding is to provide an addition electrical connection "to connect the read-head to the slider substrate through a much smaller resistance to reduce the time constant [of ESD discharge]. For simplicity, a direct connection with negligible resistance is acceptable." (Zhu, col. 4, ll. 39-42). Therefore, Zhu fails to disclose electrically isolated reader and write core elements as required by amended independent claim 1. Thus, the rejection of amended independent claim 1 under §102(e) should be withdrawn. Notification to that effect is requested.

Claims 9 and 10 depend from amended independent claim 1, and include all of the limitations of that base claim. Therefore, dependent claims 9 and 10 are likewise allowable over the cited art, and the rejections under §102(e) should be withdrawn. Likewise, it is believed that withdrawn claims 7 and 8 should be allowed with amended independent claim 1, from which they depend. Notification to that effect is requested.

Claim Rejections - 35 U.S.C. §103(a)

Claims 4-6, 11-14, 17-19 and 21-23 were rejected under 35 U.S.C. §103(a) as being obvious over Zhu (U.S. Pat. No. 6,870,706). The relevant disclosure of Zhu is discussed above.

Amended independent claim 11 relates to a transducing head that includes an electrical ground, a reader positioned upon a substrate, an electrically insulating material, a writer positioned adjacent to the reader and having a writer core, and a resistor electrically connected between the writer core and the electrical ground for grounding the writer. According to amended independent claim 11, the writer is positioned adjacent the reader, and the reader and the writer core are electrically isolated from one another by the electrically insulating material. Limitations of dependent claim 13, now canceled, have presently been incorporated into amended independent claim 11.

Amended independent claim 17 relates to a transducing head that includes an electrical ground, a reader, a writer that is electrically isolated from the reader, and a thin film resistor electrically connected between the writer and the electrical ground for grounding the writer.

In order to establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. *In re Kotzab*, 217 F.3d 1365 (Fed. Cir. 2000); MPEP 2143.01 and 2143.03. Rejections under 35 U.S.C. §103 must also rest on a factual basis, and an examiner may not rely upon speculation, unsubstantiated assumptions or hindsight reconstruction. *In re Warner*, 37 F.2d 1011, 1017 (CCPA 1967), *cert denied*, 389 U.S. 1057 (1968). Moreover, if the proposed modification of the prior art would change the principle of operation of the prior art

invention being modified, then the teachings of the cited references are not sufficient to render a claim *prima facie* obvious. *In re Ratti*, 270 F.2d 810 (CCPA 1959).

Zhu does not disclose, teach or suggest each and every limitation of amended independent claim 11, because, as discussed above, Zhu fails to show, teach or disclose a reader and a writer (or a writer core thereof) that are electrically isolated from one another as required by that claim. Rather, Zhu discloses that the read head 2 and the write head 4 are electrically linked together. Zhu contains no suggestion for modifying its structures (or those of the prior art) to eliminate the electrical link between the read head 2 (i.e., the undershield 10 of the reader 2) and the write head 4 (i.e., the writer core 18 of the write head 4). Indeed, the only way in which grounding could be provided to the writer core 18 and the writer 4 of Zhu is by way of the electrical connection between the writer core 18 and the read head 2. In that respect, eliminating the electrical connection between the read head 2 and the writer core 18 of the write head 4 would eliminating any grounding function provided to the writer core 18 and the write head 4.

Furthermore, as noted at pages 3 and 4 of the present application, known "reader bleeder" resistors like those of Zhu primarily protect reader elements during fabrication of hard disc drives. This places unique constraints on reader bleeder resistors, such as the fact that reader bleeder resistors are constrained to high resistances to avoid introducing noise from the substrate to the reader. Indeed, Zhu only discloses resistors having a resistance of 10 kilo Ohms (10 k Ω) or more, which is a range that only encompasses relatively large resistances. (Zhu, col. 8, ll. 62-3; col. 9, ll. 25-26). The Office Action states that having a resistor between a reader and a substrate would have been "wholly applicable and advantageous when applied between the writer and the substrate." However, the unique constraints faced with known reader bleeder resistors are distinguishable from the present invention, and known reader bleeder art does not address the matter of electrically isolating the reader and the writer core.

Thus, the rejections of amended independent claims 11 and 17 under §103(a) should be withdrawn. Notification to that effect is requested.

Claims 4-6 depend from independent claim 1 and include all of the limitations of that base claim, claims 12 and 14 depend from amended independent claim 11 and include all of the limitations of that base claim, and claims 18, 19 and 21-23 depend from amended independent claim 17 and include all of the limitations of that base claim. For the reasons discussed above with respect to independent claims 1, 11 and 17, dependent claims 4-6, 12, 14, 18, 19 and 21-23 are likewise allowable over the cited art. Furthermore, dependent claims 4-6, 12, 14, 18, 19 and 21-23 contain additional limitations not disclosed, taught or suggested by the prior art of record. For example, dependent claims 5, 12 and 18 each specify a range of possible resistances for a resistor that encompasses much smaller resistances than those disclosed by Zhu. As noted above, reader bleeder resistors like those of Zhu face unique design constraints, such as the fact that reader bleeder resistors must generally have high resistances to avoid introducing noise from the substrate to the reader.

Thus, all of dependent claims 4-6, 12, 14, 18, 19 and 21-23 are in condition for allowance over the cited art. The rejections of those claims under §103(a) should be withdrawn. Notification to that effect is requested.

Claim 2 was rejected under 35 U.S.C. §103(a) as being obvious over Zhu in view of Hirano et al. (U.S. Pat. No. 6,853,517) and/or Hanchi et al. (U.S. Pat. No. 6,967,805). The Office Action states that Zhu does not disclose a grounded disc, but cites Hirano et al. and Hanchi et al. as each disclosing that a hard disc drive disc should be grounded.

Claim 2 depends from amended independent claim 11, and include all of the limitations of that base claim. Therefore, dependent claim 2 is likewise allowable over the cited art, and the rejection of that claim under §103(a) should be withdrawn. Notification to that effect is requested.

CONCLUSION

In view of the foregoing, all of the pending claims are in condition for allowance. Notification to that effect is requested. If it would in any way facilitate examination of the present application, the Examiner is invited to contact the undersigned at the phone number below.

The Commissioner is authorized to charge any additional fees associated with this paper or credit any overpayment to Deposit Account No. 11-0982.

Respectfully submitted,

KINNEY & LANGE, P.A.

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By: Austen Zuege

Austen Zuege, Reg. No. 57,907
THE KINNEY & LANGE BUILDING
312 South Third Street
Minneapolis, MN 55415-1002
Telephone: (612) 339-1863
Fax: (612) 339-6580

AZ:kmm